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Red Alder Kitchen Cabinets—How Does Application of Commercial Stains Influence Customer Choice?

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Abstract

A better understanding of consumer reaction and preferences for red alder (*Alnus rubra* Bong.) secondary products will help Alaska producers in entering new markets. In this study, red alder kitchen cabinets were commercially stained to six different levels and displayed at home shows in Portland, Oregon, and Anchorage, Alaska. The stains simulated the appearance of six commercial species. Respondents indicated their preferred cabinet doors, under the assumption of remodeling their kitchen. Brighter shades of stain were generally more popular than the three darkest shades. There were no statistically significant differences in preferences between male and female respondents. The influence of market location was found to be highly significant for unstained and for maple stained cabinets. These results indicate a strong potential for red alder to be commercially stained to a wide range of appearances, targeting different demographic groups.

Keywords: Red alder, cabinets, commercial stain, consumer preference, Alaska forest products.

Introduction

Over the past several decades, red alder (*Alnus rubra* Bong.) has increasingly been used for a variety of secondary wood products. The species has become one of increasing commercial importance and is the most commonly used hardwood in the Pacific Northwest. Once considered a weed species, red alder is now widely used for furniture, architectural millwork, and other secondary manufactured products. Standing timber inventories of red alder have surpassed 9 billion board feet in

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western Oregon, with more than one-third of the trees being 18 inches diameter or larger (Gedney 1990). In Washington state, the average volume of red alder harvested annually between 1992 and 2002 was 212 million board feet (Larsen and Nguyen 2004). As early as 1990, 75 percent of the red alder harvested in Washington was being manufactured into lumber products (Ekstrom 1992). This consumer preference study evaluates the popularity of red alder kitchen cabinets in two Pacific Northwest locations.

Although red alder's natural range extends to southeast Alaska, an industry has yet to develop there. Red alder in southeast Alaska is often found in abundance along roadbeds, in areas that have experienced soil disturbance, and in areas harvested during the region's pulp mill era (lasting from about 1955 to 1995). Many of these easily accessible stands are now reaching commercial sawtimber size. Although the total forested area of red alder in southeast Alaska is relatively small, the estimated growing stock of about 25 million cubic feet (net volume) within two inventory units of the Tongass National Forest (van Hees 2001a, 2001b) could support a red alder industry.

Red alder log prices have continued to increase, recently approaching $600 per thousand board feet, and for the first time (in 2000) surpassing Douglas-fir (*Pseudotsuga menziesii* (Mirbel) Franco) in price (Mason 2003). Similar price trends for red alder lumber were recorded over a recent 4-year period in which wholesale lumber prices increased by a substantial 40 percent (Ekstrom 1992). With higher prices come continued opportunities for red alder, potentially including smaller diameter stands from southeast Alaska. Increased utilization of red alder could lead to a range of new opportunities for Alaska wood products firms, including export of logs, kiln-dried lumber, and secondary manufactured products such as furniture and kitchen cabinets.

Successful product marketing will be a key element in developing a red alder industry in southeast Alaska. Red alder cabinets have been shown to compete well in consumer marketing trials versus commercial hardwoods such as red oak (*Quercus rubra* L.), hickory (*Carya* spp.), maple (*Acer* spp.), and cherry (*Prunus* spp.) (Nicholls et al. 2003, 2004). A better understanding of consumer recognition of red alder in relation to established commercial species will assist secondary manufacturers in Alaska best decide how to enter new markets. One possible marketing approach is to "mimic" established species through application of commercial stains, as described in this report. An alternative method for altering the color of red alder is to allow fresh-sawn lumber to oxidize, creating a natural dark color. Once inside the dry kiln, lumber can experience further color changes through various dry-kiln schedules. Thus, lumber manufacturers have several means for

changing the appearance of red alder before it reaches consumers. The objective of this study was to evaluate the popularity of red alder cabinets, stained to six different levels with commercial stains, considering selected demographic factors.

Methods

In this consumer preferences study, more than 600 home show attendees evaluated cabinets at two Pacific Northwest events in 2005 (Portland, Oregon, and Anchorage, Alaska). All respondents were at least 18 years old (and received either a chocolate bar or a key chain for their efforts). Data collection was conducted in cooperation with University of Alaska.

Respondents were asked to assume they would be remodeling their current kitchen and indicate their preferences for levels of stain by selecting their first, second, and third favorite cabinet doors of the seven presented. Demographic information regarding age, gender, household income, and home ownership was also obtained.

Cabinet Staining and Construction

To create the study samples, six cabinet doors were each stained with one of six commercial stains purchased from a stain and coating manufacturer. After staining, doors received an application of clear-coat finish. One unstained red alder cabinet was also included, bringing the total to seven doors. Although each door was treated with a different stain, the doors appeared to be grouped into three classes: light, medium, and dark. All doors were rectangular and of raised-panel style construction, and only clear (defect-free) red alder was used (fig. 1). Cabinet door dimensions were selected to be similar to those in common use (outside dimensions of about 11.5 inches wide by 17 inches high).

Cabinet Door Labeling

Previous research has shown that name-based evaluations of wood can often differ from appearance-based evaluations, indicating the importance of product labeling (Bumgardner and Bowe 2002). Other studies have shown that overall popularity and consumer willingness to pay for secondary wood products can be directly related to presence (versus absence) of information such as species name (Nicholls et al. 2004, Roos et al. 2005).

Our current study considered three methods of product labeling. In labeling method 1, alder cabinets were identified with the word "alder" plus the species being simulated through staining (e.g., "alder stained as maple" and "alder stained as oak"). In labeling method 2, no information was provided. In labeling method 3,

Figure 1—Cabinet door having light stain ("alder stained as oak"), medium stain ("alder stained as pine"), or dark stain ("alder stained as walnut").

the simulated species was mentioned, but not the word "alder" (e.g., "maple stain" and "oak stain"). In this paper we consider the aggregate demographic results of all three labeling methods (comparisons between labeling methods will be considered separately).

Sample Demographics

Respondents were predominantly female (two-thirds). Almost 37 percent of respondents were between 51 and 60 years of age, and about 26 percent were 41 to 50 years old.

Respondents, by age

Years	Percentage of total
18-30	7.00
31-40	14.00
41-50	26.17
51-60	36.83
61-70	12.83
>70	3.17

Household income ranged from $76,000 to $100,000 per year for 29 percent of respondents and from $51,000 to $75,000 for about 26 percent of respondents.

Respondents, by household income

Dollars per year[1]	Percentage of total
<25,000	2.2
26,000–50,000	16.7
51,000–75,000	26.1
76,000–100,000	28.8
101,000–125,000	12.8
126,000–150,000	5.7
>150,000	7.7

Results

Overall Popularity

One clear trend was that the brighter shades of stain were considerably more popular than darker shades (table 1). For example, walnut, chestnut, and mahogany stains (the three darkest) were the three least popular cabinets by a wide margin. Pine, unstained, oak, and maple (the four brightest) were the most popular.

Gender

Several differences in male versus female preferences are worth noting. Women preferred oak-stained cabinets by a considerable margin compared to men, whereas more men than women preferred pine-stained and maple-stained cabinets (table 1). The oak-stained cabinet was the only one that clearly had a brighter appearance than the unstained cabinet, whereas the pine-stained cabinet had a somewhat darker appearance (i.e., a more reddish hue) than the unstained cabinet. Despite these trends, there were no statistically significant differences in cabinet preferences based on gender (table 1).

Age

There were few clear trends for staining preferences based on age class (table 2). Unstained cabinets and pine-stained cabinets had broad appeal for most ages. Mahogany-stained and walnut-stained cabinets, although relatively unpopular overall, had greater preference among younger respondents than older (table 2).

[1] Rounded to the nearest $1,000.

Income

Unstained cabinets were most often selected as favorite among respondents having an annual household income of $75,000 or less (table 3). Among higher income respondents (those earning more than $75,000 per year—55 percent of respondents), oak- and pine-stained cabinets were generally preferred, as were unstained cabinets. There were statistically significant differences between income class groups for mahogany stained cabinets (table 3).

Location

Regional differences were evaluated for both home show locations (table 4). Only two cabinets showed statistically significant differences between Portland, Oregon, and Anchorage, Alaska. Anchorage respondents showed a greater preference for unstained cabinets than did Portland respondents. Portland respondents showed a greater preference for maple-stained cabinets than did Anchorage respondents. Chestnut-stained cabinets showed borderline statistical significance (being preferred in Portland).

Table 1—Gender preferences for commercially stained red alder cabinet doors

	Cabinet door	Overall	Male	Female	t-value	Significance
		Percentage of time chosen as favorite				
	Unstained	21.4	20.9	21.6	0.242	0.809
Lighter	Oak stain	18.8	15.3	20.6	1.588	.113
↓	Maple stain	18.6	20.9	17.0	1.098	.273
	Pine stain	22.1	24.5	21.1	.876	.381
	Chestnut stain	6.5	6.6	6.4	.103	.918
	Mahogany stain	10.2	9.7	10.7	.400	.689
Darker	Walnut stain	2.4	2.1	2.6	.390	.696
	Total	100	100	100		

Table 2—Analysis of variance for favorite commercially stained red alder cabinet doors, by age of respondents

		Age in years							
	Cabinet door	**18-30**	**31-40**	**41-50**	**51-60**	**61-70**	**>70**	**F-value**	**Significance**
		Percentage of time chosen as favorite							
	Unstained	28.6	20.5	19.1	21.3	17.1	36.8	1.338	0.230
Lighter	Oak stain	14.3	13.3	17.8	21.3	19.7	15.8	.542	.803
↓	Maple stain	11.9	22.9	17.8	16.7	23.7	15.8	.667	.700
	Pine stain	21.3	18.1	22.9	19.9	23.7	31.6	.909	.499
	Chestnut stain	2.4	9.6	6.4	6.8	5.3	0	.607	.750
	Mahogany stain	16.7	14.5	12.7	8.1	4.0	0	1.651	.119
Darker	Walnut stain	4.8	0	1.9	3.2	2.6	0	.625	.736
	Unspecified stain	0	1.1	1.4	2.7	3.9	0		
	Total	100	100	100	100	100	100		

Table 3—Analysis of variance for favorite commercially stained red alder cabinet doors, by income class

		Household income in 1,000 dollars per year								
	Cabinet door	**<25**	**26-50**	**51-75**	**76-100**	**101-125**	**126-150**	**>150**	**F-value**	**Significance**
		Percentage of time chosen as favorite								
	Unstained	25.0	26.4	23.2	21.7	11.4	22.6	26.2	1.033	0.403
Lighter	Oak stain	16.7	18.7	19.0	17.2	25.7	9.7	11.9	.913	.485
↓	Maple stain	8.3	16.5	16.9	18.5	20.0	16.1	19.1	.215	.972
	Pine stain	25.0	17.6	16.9	23.6	15.7	22.6	31.0	1.093	.365
	Chestnut stain	0	4.4	9.2	7.6	5.7	12.9	0	1.362	.228
	Mahogany stain	16.7	13.2	7.0	7.6	20.0	12.9	9.4	1.875[a]	.083
Darker	Walnut stain	8.3	2.2	3.5	1.3	0	3.2	2.4	.932	.472
	Unspecified stain	0	1.0	4.3	2.5	1.5	0	0		
	Total	100	100	100	100	100	100	100		

[a] Significant at 0.10 level by using ANOVA analysis.

Table 4—Regional differences for favorite commercially stained red alder cabinet doors

	Cabinet door	Portland, Oregon (299 responses)	Anchorage, Alaska (310 responses)	Total	t-value	Significance
		Percentage of time chosen as favorite				
	Unstained	14.4	27.4	21.4	3.993[a]	0.000
Lighter	Oak stain	16.1	20.7	18.8	1.462	.144
↓	Maple stain	26.1	10.7	18.6	5.028[a]	.000
	Pine stain	22.4	21.0	22.1	.431	.667
	Chestnut stain	8.4	4.5	6.5	1.940[b]	.053
	Mahogany stain	9.7	10.3	10.2	.256	.798
Darker	Walnut stain	2.0	2.6	2.4	.472	.637
	Other[c]	.9	2.8			
	Total	100	100			

[a] Significant at 0.05 level by using ANOVA analysis.
[b] Significant at 0.10 level by using ANOVA analysis.
[c] Some respondents did not indicate a favorite cabinet door but provided other survey results.

Considerations

Wood products manufacturers have a great deal of control over their product's appearance features (and resulting customer preferences) simply by choice of commercial stain. Because product styles and species preferences can change from year to year, it is particularly important to stay abreast of current trends. Because of its versatility and ease of staining, red alder is well suited to simulate the appearance of species that are most in demand. However, any number of species (not just red alder) could potentially be stained to a desired appearance by using the commercial stains considered in this report. This study found that lighter shades of stain are preferred by wide margins versus the darkest shades, and indicates the importance of market location on consumer preferences for red alder cabinets.

Metric Equivalents

When you know:	Multiply by:	To find:
Board feet, log scale	0.0045	Cubic meters, logs
Cubic feet	0.0283	Cubic meters
Inches	2.54	Centimeters

Literature Cited

Bumgardner, M.S.; Bowe, S.A. 2002. Species selection in secondary wood products: implications for product design and promotion. Wood and Fiber Science. 34(3): 408–418.

Ekstrom, H. 1992. Pacific Northwest hardwoods capture international attention: an analysis of the Washington state hardwood industry. Center for International Trade of Forest Products (CINTRAFOR) Working Paper 37. Seattle, WA: University of Washington, College of Forest Resources. 87 p.

Gedney, D.R. 1990. Red alder harvesting opportunities. Resour. Bull. PNW-RB-173. Portland, OR: U.S. Department of Agriculture, Forest Service, Pacific Northwest Research Station. 17 p.

Larsen, D.N.; Nguyen, Q. 2004. Washington timber harvest 2002. Olympia, WA: Washington State Department of Natural Resources. 68 p.

Mason, L. 2003. After decades of Douglas-fir plantations, is it time for forest landowners to consider planting alder and cedar? Rural Technology Initiative Fact Sheet 22. Seattle, WA: University of Washington, College of Forest Resources. 4 p.

Nicholls, D.; Donovan, G.; Roos, J. 2003. Red alder stacks up to other hardwoods. Wood and Wood Products. October: 61–64.

Nicholls, D.; Donovan, G.; Roos, J. 2004. Kitchen cabinets from red alder—a comparison to other hardwoods. Wood and Fiber Science. 36(3): 432–442.

Roos, J.; Donovan, G.; Nicholls, D. 2005. How does species name affect consumer choice? An analysis and implications for cabinet door marketers. Forest Products Journal. 55(5): 21–26.

van Hees, W.W.S. 2001a. Summary estimates of forest resources on unreserved lands of the Ketchikan Inventory Unit, Tongass National Forest, southeast Alaska, 1998. Resour. Bull. PNW-RB-233. Portland, OR: U.S. Department of Agriculture, Forest Service, Pacific Northwest Research Station. 8 p.

van Hees, W.W.S. 2001b. Summary estimates of forest resources on unreserved lands of the Stikine Inventory Unit, Tongass National Forest, southeast Alaska, 1998. Resour. Bull. PNW-RB-232. Portland, OR: U.S. Department of Agriculture, Forest Service, Pacific Northwest Research Station. 8 p.

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